

WHAT IS CLAIMED IS:

1. A cylindrical cleaning element having an axial through-hole formed therein, so as to hold a rotary shaft in the through-hole with a press-fit, the cylindrical cleaning element being capable of being in either a wet state or a dry state, wherein when the cylindrical cleaning element is separated from the rotary shaft, the through-hole of the cylindrical cleaning element in a wet state has a diameter smaller than a shaft diameter of the rotary shaft and capable of being enlarged, and the cylindrical cleaning element in a dry state is capable of being set in a form such that the through-hole is enlarged.

2. The cylindrical cleaning element according to claim 1, wherein the cylindrical cleaning element is made of sponge comprising polyvinyl acetal or polyvinyl formal.

3. The cylindrical cleaning element according to claim 1, which is caused to be in a wet state before being in the dry state, and purified in the wet state.

4. A cleaning member comprising:

a cylindrical cleaning element having an axial through-hole formed therein; and

a rotary shaft held in the through-hole with a press-fit,

the cylindrical cleaning element being capable of being in either a wet state or a dry state, wherein when the cylindrical cleaning element is separated from the rotary shaft, the through-hole of the cylindrical cleaning element in a wet state has a diameter smaller than a shaft

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diameter of the rotary shaft and capable of being enlarged, and the cylindrical cleaning element in a dry state is capable of being set in a form such that the through-hole is enlarged, and wherein the press-fit of the rotary shaft in the through-hole of the cylindrical cleaning element is performed when the cylindrical cleaning element is in a wet state.

5. The cleaning member according to claim 4, wherein each of the rotary shaft and the through-hole has a circular cross-section.

6. The cleaning member according to claim 1, wherein a surface of the rotary shaft is formed so as to include raised and recessed portions for preventing a sliding motion.

7. The cleaning member according to claim 4, wherein the cylindrical cleaning element is caused to be in a wet state before being in a dry state, and purified in the wet state.

8. The cleaning member according to claim 4, wherein the cylindrical cleaning element is made of sponge comprising polyvinyl acetal or polyvinyl formal.

9. A method for producing a cylindrical cleaning element, comprising:

preparing a cylindrical cleaning element having an axial through-hole formed therein for passing the rotary shaft, the cylindrical cleaning element being capable of being in either a wet state or a dry state and the through-hole having, in a wet state, a predetermined diameter smaller than a diameter of the rotary shaft;

wetting the cylindrical cleaning element;

enlarging the through-hole of the wet cylindrical cleaning element so that it has a diameter larger than the diameter of the rotary shaft; and

dry-setting the enlarged cylindrical cleaning element.

10. A method for producing a cylindrical cleaning element, wherein the cylindrical cleaning element is purified in the wet state.

11. A method for producing a cleaning member comprising a cylindrical cleaning element and a rotary shaft held therein with a press-fit, the method comprising:

preparing a rotary shaft and a cylindrical cleaning element, the rotary shaft having a predetermined diameter, the cylindrical cleaning element having an axial through-hole formed therein and being capable of being either in a wet state or a dry state, the through-hole having, in a wet state, a predetermined diameter smaller than the diameter of the rotary shaft;

wetting the cylindrical cleaning element;

enlarging the through-hole of the wet cylindrical cleaning element so that it has a diameter larger than the diameter of the rotary shaft;

dry-setting the enlarged cylindrical cleaning element;

inserting the rotary shaft into the through-hole of the dry-set cylindrical cleaning element; and

wetting the cylindrical cleaning element into which the rotary shaft has been inserted, to thereby contract the

diameter of the through-hole of the cylindrical cleaning element and provide a press-fit between the cylindrical cleaning element and the rotary shaft.

12. The method according to claim 11, wherein a cylindrical cleaning element made of sponge comprising polyvinyl acetal or polyvinyl formal is prepared as the cylindrical cleaning element.

13. A tool for enlarging a diameter of a cylindrical cleaning element used in a method for forming a cleaning member, in which a cylindrical cleaning element having an axial through-hole formed therein and having a predetermined inner diameter in a wet state is caused to be wet and the through-hole of the wet cylindrical cleaning element is enlarged, the cylindrical cleaning element is dry-set in a form such that the through-hole is enlarged, a rotary shaft is inserted into the through-hole of the dry-set cylindrical cleaning element, the rotary shaft having an outer diameter smaller than a diameter of the enlarged through-hole and larger than the predetermined inner diameter of the through-hole, and the dry-set cylindrical cleaning element after insertion of the rotary shaft is caused to be wet, to thereby provide a press-fit between the cylindrical cleaning element and the rotary shaft to form a cleaning member,

the tool being adapted to be used for enlarging an inner diameter of the wet cylindrical cleaning element in the method and comprising:

a cylindrical segmented core rod having an axial

through-hole formed therein and capable of being
diametrically enlarged or contracted, the segmented core
rod being adapted to be inserted in a contracted state into
the through-hole of the wet cylindrical cleaning element;
and

a diameter-enlarging element adapted to be inserted
into the through-hole of the segmented core rod which has
been inserted into the through-hole of the cylindrical
cleaning element, so as to enlarge a diameter of the
segmented core rod to a diameter larger than the outer
diameter of the rotary shaft.

14. The tool according to claim 13, wherein the segmented
core rod has a generally circular cross-section and
includes a plurality of slits arranged in a circumferential
direction thereof in a predetermined spaced relationship
and extending in an axial direction of the segmented core
rod, and comprises a plurality of segments divided by the
slits and extending in the axial direction.

15. The tool according to claim 14, wherein the through-
hole of the segmented core rod has a taper surface which is
tapered from opposite ends thereof toward the center of the
segmented core rod, and wherein the diameter-enlarging
element comprises two elements inserted from the opposite
ends of the through-hole of the segmented core rod, each of
the elements being tapered from a base end to a distal end
thereof in conformity to the taper surface of the through-
hole and adapted to be inserted from an end portion of the
through-hole of the segmented core rod to a predetermined

depth into the through-hole, to thereby enlarge the diameter of the segmented core rod to the diameter larger than the diameter of the rotary shaft.

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